

farmer's bulletins issued by each experiment station, and distributed post-free throughout the State to every farmer asking to receive them, are of considerable educational value. The work of all the State colleges and experiment stations is unified by the Association of American Agricultural Colleges and Experiment Stations. This Association consists of delegates appointed by the colleges and stations, and by the United States Department of Agriculture, and meets for several days once a year to hear reports and discuss methods of work. The Association has permanent executive committees, which carry out the work initiated by the Association.

Although both colleges and experiment stations are State institutions, they are more or less under the influence of the National Department of Agriculture, as every institution receives annual grants from Government funds, for the proper use of which the Department of Agriculture is made responsible. The United States Department of Agriculture is on a very large scale; the sum appropriated to its use by Congress in 1899 was 2,829,702 dollars. It includes many sub-departments, provided with a numerous staff of scientific workers. It has excellent laboratories, a botanic garden, museum and library containing 68,000 volumes, three-quarters of which are on agricultural subjects. It undertakes investigations of all kinds. It publishes in the *Experiment Station Record* summaries of all the work done by the experiment stations. The publications it issues for gratuitous circulation are most voluminous, and embrace all subjects with which it is thought the farmer or student should be acquainted. In 1899, 26,420 pages were published, and 7,075,975 copies printed. Of the present year-book the edition is 500,000 copies, with 20,000 extra copies for the Paris Exhibition.

We have already mentioned the sum annually spent by Congress on the Department, we may conclude by saying that the annual income of the State agricultural and mechanical colleges is stated in the year-book to be 6,008,379 dollars, while the income of the experiment stations amounts to 1,143,334 dollars. Such is in brief the provision made in the United States for the improvement of the science and practice of agriculture in the country.

R. WARINGTON.

#### OUR BOOK SHELF.

*Lehrbuch der Anorganischen Chemie.* Von Dr. A. F. Holleman. In gemeinschaft mit dem Verfasser bearbeitet und herausgegeben von Dr. Wilhelm Manchot. Pp. xii + 440. (Liepzig: Veit and Co., 1900.)

THIS is an advanced text-book of inorganic chemistry, distinguished from others chiefly by the embodiment in it of chapters of modern physical chemistry. The book, indeed, gives the impression of having been produced by shuffling the detached chapters of two others—one, an ordinary treatise on inorganic chemistry, the second on physical chemistry.

It is almost impossible to discern the system which has guided the compilers. The book begins with some generalities about the scope of science, and the differences between physics and chemistry. It then proceeds to describe some chemical operations, such as dissolving, filtering and distilling. This is done in language suitable for children, and illustrated by two diagrams, in one of which a filter paper is seen to project considerably above the rim of the funnel. The elements having been named,

oxygen is next described—such terms as critical temperature being taken as understood by the reader, who has just been told how to separate salt from sand. After a description of hydrogen, the indestructibility of matter is discussed, and then comes water. The laws of chemical combination and the atomic theory occupy the next few pages, then chlorine and its compounds. We now come upon the laws of Gay Lussac and Avogadro, ozone and hydrogen peroxide, then modern methods of determining molecular weights, with a discussion of semi-permeable membranes. And so the book proceeds. Dissociation is discussed between iodine and fluorine, electrolytic dissociation between the halogens and sulphur, the phase rule under sulphur, thermochemistry, including thermodynamics between sulphur and nitrogen.

It is impossible to say anything in praise of this arrangement or want of arrangement. It can hardly be defended on logical or didactic grounds, and one is tempted to think that there is nothing more than a striving for novelty at the bottom of it.

The book does not aim at teaching how chemists do their work, discover facts, and establish theories; and surely if it were desired to present descriptive inorganic chemistry on the basis of the general theories of modern physical chemistry, it would have been better to have begun with an account of these theories and to have woven them into the descriptive part throughout.

Whilst speaking thus of the general scope of Prof. Holleman's book, it is right to add that in detail there are features that call for commendation. The descriptive part is well abreast of the times, and many of the intercalated chapters on physical chemistry are clearly and concisely written. A concluding chapter summarising Werner's voluminous papers on the metal-ammonium compounds is a valuable addition.

On the whole, it may be said that as a work of moderate dimensions conveying the chief facts of inorganic chemistry and an account of those physico-chemical theories which bear especially on inorganic chemistry, Prof. Holleman's book will probably find considerable acceptance in Germany, but it is neither to be expected nor desired that it will set a fashion in its plan of construction.

A. S.

*Flora of Bournemouth, including the Isle of Purbeck.* By E. F. Linton, M.A. With map. New edition. Pp. vii + 290. (Bournemouth: Sold by H. S. Commin, Bright's Stores, and W. Mate and Sons.)

THE local flora embodied in the pages of the book before us appears to be usefully compiled, though perhaps the volume as a whole would have been improved had it been printed on thinner paper, so as to form a more convenient pocket companion. Opening with a short introduction on the physical and geological characters of the district, the author gives a list of some 1137 plants (flowering plants and ferns) as occurring within the area treated of, and adds localities, as is usual in works of this nature. The book should prove useful to those lovers of wild flowers who are visiting the Bournemouth district, to many of whom it may perhaps be a matter of surprise that so large a percentage of the British flora occurs within a twelve-mile radius from the town.

*Carnations and Picotees for Garden and Exhibition.* By H. W. Weguelin, F.R.H.S. Pp. viii + 125. (London: George Newnes, Ltd., 1900.)

THIS is a book which will be useful to those who are fond of carnations. The cultural hints are clear, and lists are given of many of the best sorts. The text is a little diffuse in places, but in a work of this character that is a pardonable characteristic. The author is enthusiastic on his subject, and his book is worth reading, if only to show what can be done with the flowers as materials for open borders.